IN THE SPECIFICATION

Page 1, lines 11 to 32, replace the paragraphs with the following amended paragraphs.

One of the most common complaints of hearing aid users is that their own voice sounds unnatural: boomy, hollow or echoing. Poor sound quality of a person's own voice is also one of the top ten reasons why some hearing aids end up in the drawer. This problem with a person's own voice is very often due to the so-called occlusion effect which occurs because the body-conducted contribution to a person's perception of his/her own voice is trapped in the cavity between the occluding earmold of the hearing instrument and the tympanic membrane. The result is a build-up of sound pressure at low frequencies that may be as much as 30 dB relative to the open-ear. Typically, the occlusion effect has a flat maximum between 80-500 Hz and vanishes above 1 kHz. In the open-ear condition and at the low frequencies considered here, the body-conducted contribution is insignificant compared to the air-conducted contribution.

In today's hearing aid dispensing there are basically three ways to address the client's eventual occlusion problem with his/her own voice. First, the earmold (or ITE hearing aid) may be equipped with a vent[[,]] through which the body-conducted part of his/her own voice can dissipate. Secondly, it has been shown that CIC instruments that are fitted with a seal in the bony part of the ear canal can solve or at least reduce the occlusion problem in many cases. Unfortunately, bony sealed

CICs have earned a bad reputation for introducing physical discomfort and are hence rarely dispensed. Thirdly, occlusion problems may be dealt with by counseling - along the lines of "You'll get used to it!". A number of hearing aid users do not manage to get used to it, and they prefer to live with their hearing disorder un-aided.

Page 2, lines 1 to 7, replace the paragraph with the following amended paragraph.

In ~~US patent~~ U.S. Patent No. 4,985,925 an active noise reduction based on a negative feed back electro-acoustical system is shown. The system consists of an electronic earplug seated in the concha fossa combining active and passive noise reduction in the quiet zone at the ear, a bilateral transducer circuit which drives a speaker as an acoustical velocity source, a shunt feed back control filter network which improves stability and increases noise reduction, and a combined input noise-filter/feed back system. A typical application is in a noisy environment for hearing protection and for improved communication capability.

Page 2, lines 16 to 25, replace the paragraph with the following amended paragraph.

This is achieved in a method for counteracting the occlusion effect of an electronic device delivering an audio signal to the ear, like a hearing aid or an active ear protector ~~according to claim 1~~. The electronic device ~~comprises~~ includes a transmission path with an external microphone or input line which receives a signal from the environment and a signal processor and a receiver which receives a signal from the signal processor and delivers sound signals to the ear, whereby an ear piece is inserted into the ear canal and totally or partially blocks the canal. The sound conditions in the cavity between the ear piece and the tympanic membrane are directly or indirectly determined, and whenever conditions leading to occlusion problems are present, the transmission characteristic of the transmission path to the receiver counteracts the occlusion effect.

Page 2, line 33 to page 4, line 16, replace the paragraphs with the following amended paragraphs.

In an embodiment of the invention ~~according to claim 2~~ the conditions leading to occlusion problems are determined by monitoring the activity of the ~~users~~ user's own voice, and when a user's own voice activity is detected, the amplification through the signal processor in the frequency

region below 1 kHz is reduced. It is the sound transmission through the tissue of the sound from a user's own voice[[,]] which often leads to the sound pressure build up in the cavity. This can be compensated for by reducing the amplification through the hearing aid in the relevant frequency region below 1 kHz. Hereby, the total sound pressure level in the cavity becomes comfortable. There are a number of ways in which a user's own voice activity can be monitored. One way is to analyze the input signal from the usual microphone and to determine when characteristics which are special to the user's voice are present in the signal. Also, it is possible to use a vibration monitor which monitors the level of vibration in the tissue adjacent to the ear piece. Possibly, the vibration monitor is built into the ear piece.

~~According to claim 3 the~~ The sound conditions in the cavity ~~are~~ can be monitored by an additional microphone, which is acoustically coupled to the cavity. The signal from the additional microphone is used in a feed back loop to the receiver in order to attenuate the low frequency part of the sound in the cavity. The feed back loop attenuates all low frequency sounds regardless of whether they stem from body functions such as chewing or from own voice or from another source.

When the occlusion problem is solved as described above the attenuation of the low frequency parts of the sound also is applied to the sound, which is received from the surroundings, and this is not desirable.

~~According to claim 4 this is~~This can be overcome by having the signal

processor ~~amplifying~~ amplify the low frequency part of the signal from the external microphone in order to compensate for the attenuation of the useful part of the signal from the external microphone or input line. In this way the useful low frequency parts of the signal, which are attenuated by the feed back loop, may be restored in the signal processor. Thus, the user gets the sound from the surroundings with the usual amplification while the occlusion effect is removed or reduced.

According to an embodiment of the invention ~~as claimed in claim 5~~ the feed back loop from the additional microphone is activated by a user's own voice activity ~~of the user~~. It is not a simple task to determine when to activate the feed back loop, but one safe clue is the activity from the user's own voice. As mentioned earlier, this can be done in many different ways and it is not crucial to the invention which way is chosen here.

In an embodiment of the invention ~~as claimed in claim 6~~ the sound entering the cavity from the tissue and causing the problematic sound levels in the cavity is captured by a vibration pick-up device. The vibration signal is filtered in a filter and combined with the signal which is captured by the external microphone or input line of the device. In this way the cause of the occlusion problem, namely the sound conducted into the ear canal from the surrounding tissue, is used in a direct feed forward manner to eliminate or reduce the low frequency sound built up in the cavity.

In a further embodiment of the invention ~~as claimed in claim 7~~ an inward pointing microphone monitors the sound pressure in the cavity. This signal is compared with the signal from the external microphone or input line, and where the comparison result is used to control the shape of the filter. In this way it is assured that the sound inside the ear canal is not allowed to become elevated due to sounds transmission through the tissue of the user and into the ear canal.

Page 4, line 28 to page 5, lines 4, replace the paragraph with the following amended paragraph.

The system of Fig. 1 comprises a microphone block comprising microphone 1, AD-converter AD and transfer function HEM. The system further comprises block 2 comprising hearing aid block HHA, additional digital block HC and DA-converter DA. An internal microphone 8 is used in a conventional feed back control system as sketched in [[f]]Fig. 1. Note that the control loop 9 is assumed to be formed in the analog domain. This is reflected in symbols for the receiver 3 H_{Ta} and internal microphone 8 H_{Ma}, transfer functions, where the subscript a denotes a transfer function between two analog signals. Furthermore, the transfer function of the analog feed back controller is denoted by D_a and finally an additional digital block H_c has been added after the hearing aid block H_{HA}, as a means of correcting the changes to the amplification characteristic of the hearing aid introduced by the feed back control system. In this set-

up H_c also includes the conversion from discrete time signal to analogue signal.

Page 6, lines 12 to 16, replace the paragraph with the following amended paragraph.

In another approach as seen in fig. 2 an additional electroacoustic transducer 10 is used, which can pick up the vibrations of the soft tissue in the ear canal 5, without picking up either the external sound pressure or the sound pressure generated in the volume 6 between the earmould 4 and the eardrum 7. An idealized block diagram of the control system using such a transducer is seen in [[f]]Fig. 2. The system of Fig. 2 comprises a microphone block comprising microphone 1, AD-converter AD and transfer function HEM. The system further comprises block 2 comprising hearing aid block HHA and DA-converter DA.